Met Office

NEWS

# World first as UK aid brings together experts to predict where cholera will strike next

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## British aid experts are working with the Met Office, to help prevent major outbreaks of cholera and save lives in war-torn Yemen.

US scientists, working with NASA satellite data, have developed a model to predict where cholera is most at risk of spreading with an impressive 92 per cent accuracy in Yemen.

UK aid is turning this from theory to reality, using these predictions and Met Office forecasting to give aid workers on the ground in Yemen the information they need to respond to cholera outbreaks quicker than ever before.

DFID is helping to prevent the deadly disease spreading any further by working with UNICEF to target the delivery of vital support to areas predicted to be at greatest risk.

This includes:

- promoting good hygiene to prevent people falling ill in the first place;
- stock-piling hygiene kits, jerry cans and chlorine to clean water in advance of an outbreak;
- providing cholera treatment kits, rehydration salts, zinc supplements and intravenous fluid packs to treat people that have fallen ill; and
- providing medical equipment for hospitals and clinics, such as cholera beds.

DFID Chief Scientist Professor Charlotte Watts said: “The conflict in Yemen is the worst humanitarian crisis in the world, with millions of people at risk of deadly but preventable diseases such as cholera.

“By connecting science and international expertise with the humanitarian response on the ground, we have for the very first time used sophisticated predictions of where the risk of cholera is highest to help aid workers save lives and prevent needless suffering for thousands of Yemenis before it’s too late.

“This breakthrough means that we no longer need to wait for cases of cholera to be detected before medical staff can start taking life-saving actions.”

Met Office Head of International Development Helen Bye said: “Through our collaboration with DFID we are able to be part of this ground-breaking approach to take early action against cholera, a waterborne disease, contracted through consuming contaminated water.

“Met Office meteorologists are able to translate our global modelling and scientific expertise to show where rain has fallen and where it will fall. We then provide weekly tailored guidance to DFID and humanitarian agencies including UNICEF to inform their life saving actions.”

Aid experts at DFID began using this data to work with UNICEF to prevent the spread of the disease in March 2018, ahead of the rainy season. Last year, Yemen suffered the worst cholera outbreak in living memory with more than 1 million suspected cases.

There has not been a significant outbreak in cholera so far this year, with the number of suspected cholera cases significantly lower than last year. For example, during the last week of June this year there were 2,597 suspected cases and 3 deaths, down from 50,825 suspected cases and 179 deaths at the same time last year.

Despite the predicted risk of cholera in Ibb – a governorate on the frontline of the conflict – being just as high this year as last year, there were only 672 suspected cases of cholera in July 2018 compared to 13,659 in July 2017.

There are a number of other factors that could have contributed to a lower number of suspected cholera cases this year, including a later rainy season, greater immunity against cholera and a change in national guidance for the recording of suspected cholera cases. However, the new actions taken as a result of the predictions are helping to save lives and reduce suffering.

This new approach is all the more important as the new guidance for recording suspected cholera cases in Yemen may make it more difficult to detect early outbreaks of cholera. Acting early and being able to target high-risk areas is critical.

UNICEF Yemen Representative Meritxell Relaño said: “The information on rainfall assessments supports the early warning on high-risk areas for cholera outbreak. This enables UNICEF and partners to refine and focus our efforts on preparedness and timely response to cholera which has affected the lives of many children in Yemen.

“These rainfall predictions have helped ensure that crucial preventive and response measures are in place where they will be most needed, including agreements with implementing partners on the ground, prepositioning of essential supplies, disinfection of water sources and deployment of community volunteers to engage households and communities on preventive hygiene behaviours including, safe water storage. As a result of this support and our other preparedness and response work, we have been able to avoid a resurgence of cholera on the scale seen in 2017.”

The Met Office’s supercomputer in Exeter makes 14 thousand trillion calculations per second allowing it to take in 215 billion weather observations from across the world every day, which are used as a starting point for UK and global weather forecasts. In Yemen, high-resolution models are used to forecast out to six days, providing UNICEF accurate and critical intelligence as they identify areas most at risk.

These forecasts have been used to improve a predictive model that was developed by scientists at two universities in the United States – West Virginia University and the University of Maryland.

The forecast produced by the Met Office and the predictions produced by the US scientists are then shared with UNICEF and other aid so they can see which neighbourhoods, schools and hospitals will be at greatest risk, helping them to target their response to where support is needed most.

This breakthrough of accurately predicting where and when the disease will spread has meant that aid workers can take action before an outbreak occurs.

It is DFID’s ambition to combine the NASA data and Met Office forecasts in order to predict outbreaks eight weeks in advance – twice the current capability. This would help aid agencies plan major vaccinations campaigns ahead of outbreaks, protecting hundreds of thousands of individuals.

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